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IMMUNE SYSTEM VS ANTIGEN INVADER

new trail

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New Trail is the University of Alberta magazine. Its purpose is not only to maintain contact with the alumni, staff, and friends of the University, but to foster their interest in and concern about the University and higher education generally. To this end, it publishes news about the University and its alumni and topical artices about various facets of University life, higher education, and a vast range of matters which emerge from the thought and work of University staff.
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A room of its own:

By Jeanette Rothrock, New Trail Staff

Although it has existed in fact since 1969, the University of Alberta Press only began to exist in substance last July, when it was authorized at last to appoint a full-time staff (of one over-worked but wildly enthusiastic editor) and was given at last a room of its own (231 Assiniboia Hall).

During the six years between, the Press managed to produce an admirable list of scholarly publications, especially admirable since they were produced in the unpaid spare moments of members of the University Press Committee. Obviously, keeping the Press a viable entity, when it could so easily have succumbed in the University's financial crises since 1969, was a labor of love.

Compared with its first six years, the Press is flourishing, although flourishing on a small break-even budget. However, this situation may also improve, for with a full-time staff, not only can it devote more emphasis to selling its published books, it also has more likelihood of obtaining Canada Council and other grants.

The University Press is looking forward to being increasingly able "to fulfil the necessary function of providing another outlet for the work of Canadian scholars, particularly those of the Prairie Provinces and Western Canada generally, for whom there are relatively few opportunities" (to quote from the Press Committee's annual report).

The following are titles which have been published by the Press during the past few years. New titles will be described in *Trail* as they appear. Any of the books may be purchased from the University of Alberta Bookstore, in the Students' Union Building on campus.

The Wordsworth Collection
Dove Cottage Papers Facsimiles, by Reynold Siemens. 1971. $12.
This is a catalogue of the Dove Cottage Papers, the vast concentration of manuscript writings by William Wordsworth and Romantics closely associated with him. One of the two facsimile versions of this research material available in North America is in the University of Alberta Library.

Reynold Siemens is Associate Professor of English at the University of Alberta.

The University of Alberta Press

The Household Book of Queen Isabella of England (Regnal Year 1311-1312), Edited by F.D. Blackley and G. Hermansen. 1971. $15.
This is the household account book for one year for Isabella of France, wife of Edward II of England. This is the first household book of an English Queen ever to be published. An introduction by the editors discusses the manuscript, the problems it presents, the structure of the queen's household, and the light shed on the troubled fifth regnal year of Edward II.

F.D. Blackley is Professor of History and G. Hermansen is Professor Emeritus of Classics at the University of Alberta.

A Bibliography of the Works of W. Somerset Maugham, by Raymond Toole Stott. 1973. $21.
A Bibliography of the Works of Louis MacNeice, by C.M. Armitage and Neil Clark. 1973. $21.
Both bibliographies contain detailed information based on collections both in the United Kingdom and in North America.

Meet Cree: A Practical Guide to the Cree Language, by H. Christoph Wolfart and Janet F. Carroll. 1973. $4.
Meet Cree does not attempt to teach the Cree language, but rather serves as an introduction to the language by pointing out the differences between Cree and English. It is the only concise, accessible, and readable discussion of Cree based on linguistic research.

The Historical Development of Diptera, by Boris Rohdendorf. 1974. $13.50.
This is the first English language edition of an established Russian work, originally published as volume 100 in the Transactions of the Institute of Paleontology of the Academy of Sciences of the USSR. It was translated by J.E. Moore and I. Thiele, and edited by the late Brian Hocking (former Chairman of the Department of Entomology at the University of Alberta), Harold Oldroyd of the British Museum (Natural History), and George E. Ball, Professor and Chairman of the Department of Entomology at the University of Alberta.

Time Sequence Analysis in Geophysics, by E.R. Kanasewich. First edition, 1974. Second edition, 1975. $15.
This book presents a "state of the art" treatment on time series and time sequence analysis as practised by the geophysical industry and used by geologists and geophysicists in their research.

Ernest R. Kanasewich, BSc'52, MSc'60, is Professor and Assistant Chairman of the Department of Physics at the University of Alberta.

A Lithuanian Bibliography, by Adam and Filomena Kantautas. 1975. $10.
Although a small country wedged between East and West, Lithuania has managed to preserve its own unique national identity. This extensive bibliography representing all points of view contains references to 10,168 books and articles written by 3,587 different authors in nearly every European language.

Mr. Kantautas retired last summer from the University of Alberta Library.

A two-volume study of Canadian urbanization:
Volume I: *The Politics of Canadian Urban Development,* by David G. Bettison. 1975. $7.
Volume II. *Urban Affairs in Alberta,* by David G. Bettison, John Kenward, and Larrie Taylor. 1975. $8.50.
These two volumes form the "Bettison Report," which was commissioned by the Human Resources Research Council of Alberta.

In *The Politics of Canadian Urban Development,* Dr. Bettison discusses the evolution of federal policy concerning regional development programs, municipal development funds, slum clearance, and urban renewal since 1935. He emphasizes the role of lending institutions and the inability of provincial governments to influence urban affairs within their own borders.

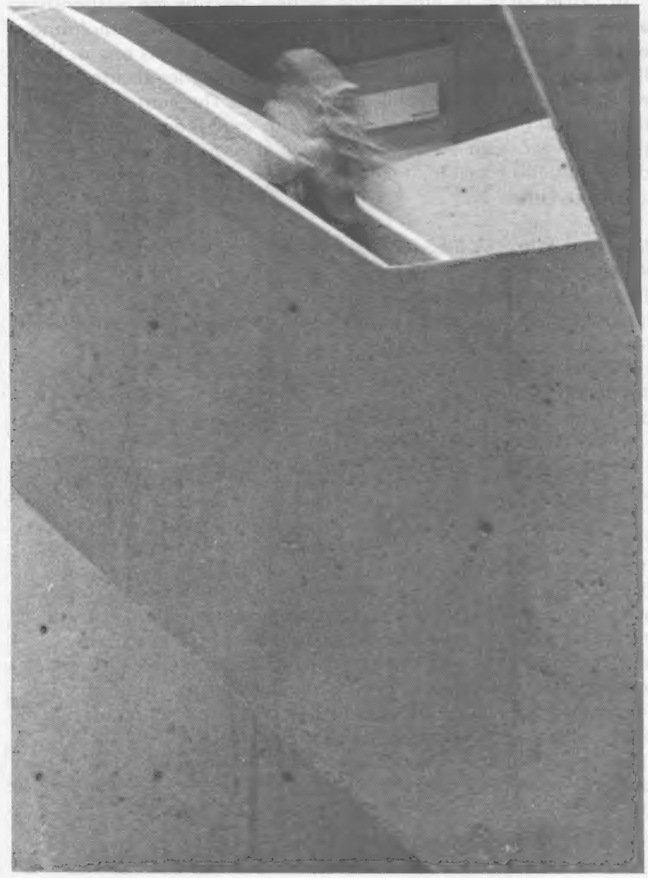
In *Urban Affairs in Alberta,* the authors describe the relationships among the important institutions of the province which mold the way cities, towns, and villages expand and decline. As one of the first provinces to pass town and country planning legislation, Alberta was prey to some early rural-urban conflicts. The authors consider the political history of the province, with special emphasis on the thirty-six year reign of the Social Credit government and the effects of its "fair and equal treatment" policy on the fate of small towns and large cities.

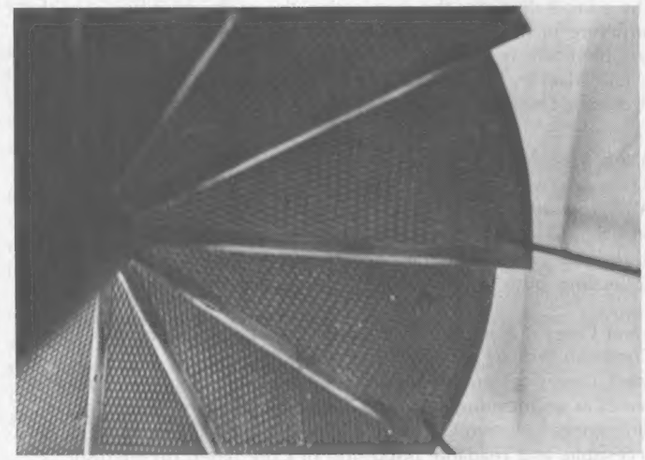
Jean-Paul Sartre: A Bibliography of International Criticism, by Robert Wilcocks. 1975. $30.
This is the largest and most comprehensive compilation to date of international criticism and journalism on the works and activities of Jean-Paul Sartre. This 800-page work, covering Sartre's stormy career from 1937 to 1975, contains nearly 7,000 entries and over 3,200 individual authors. Press articles and reviews which may not be readily available are extensively quoted.

Robert Wilcocks is Associate Professor of Modern French Literature in the Department of Romance Languages at the University of Alberta.

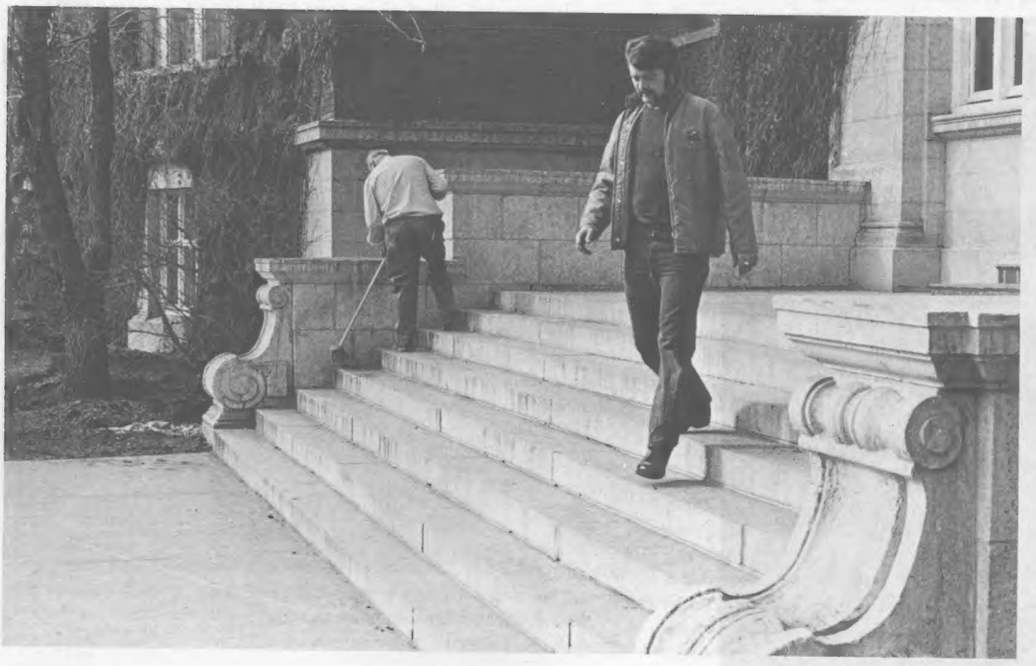
The Conservation of the California Tule Elk: A Socioeconomic Study of a Survival Problem, by W.E. Phillips. 1976. $4.
This book should interest all who are concerned with the survival and expansion of wildlife species. Working from experience with efforts to conserve the endangered Tule Elk of California, the author considers generally the social and economic conflicts which may arise from attempts to keep particular species from extinction. The author goes on to offer alternative courses of action for public policy with different socioeconomic implications.

William E. Phillips is Associate Professor of Rural Economy at the University of Alberta.





Stairs photographs by Richard Kerr, New Trail Staff



Spliced mice and other marvels

Immunological research at the University

by Greg Hickmore, New Trail Staff

There is little doubt that in recent years the aspect of modern medicine that has most intrigued and astounded the general public has been the replacement of diseased organs with sound ones. Although the transplanting of organs such as hearts and kidneys is one of the many wonders of modern medicine, transplantation itself, which includes skin grafts and blood transfusions, is a very old phenomenon. In the third century in India, for example, surgeons were preforming skin grafts of a fairly sophisticated nature. In Western culture, Gaspare Taggliacozzi, a sixteenth century anatomist from Bologna, performed transplants in the form of skin grafts to rebuild deformed or missing noses. A strip of skin was grafted from the patient's own arm to his nose; such grafts, in spite of the rudimentary and unhygienic surgical practices, had a great likelihood of success.

In our time, of course, transplantations are even more spectacular, involving, as they do, large vital organs exchanged between genetically different individuals. The problem encountered in these transplants is the same as in technically easier transplants—rejection of the donated organ or tissue by the recipient's body. Successful transplants can be achieved only if the body's jealous self-protectiveness—the way that it attacks anything that is not part of itself—can be broken down in some way so as to allow the transplanted organ to become a part of the living self of the recipient.

As a beast [the chimera] *was too heterogenous; the lion, the goat, and snake (in some texts, dragon) do not readily make up a single animal. . . . The patchwork image disappeared but the word remained, signifying the impossible.* Jorge Luis Borges

Self-integrity and its problems

Even more remote in time than third-century India or sixteenth-century Bologna, there are instances of spectacular "transplants" and grafts that, in fact, seem even more fabulous than some of the things happening today. *Fabulous* is the word for them because they occur in fables and involve mythical beings such as griffons, manticores, centaurs, minotaurs, and chimeras. Of course, our common sense tells us not to take these imaginary beasts seriously. Before dismissing these creatures as idle fantasy, however, we should first examine the grounds on which we condemn them. After all, they do form an important part of our consciousness, and fantasy and imagination have always proved vital to the growth of human knowledge.

On the basic level, these combinations of beasts are disturbing to us for they are usually composed of frightening and savage animals. They are also frightening and disturbing, however, in some less discernible way.

Possibly they frighten us because they seem to deny certain things which we believe about ourselves, both as individuals and as a species. For one thing, they deny the laws of biology that dictate discrete species. Is it possible that because we like to think of ourselves as the highest product of evolution (the process by which the various species are supposed to have become distinct), these mixtures of species offend our sense of distinctness and our ideas of our own unique individuality?

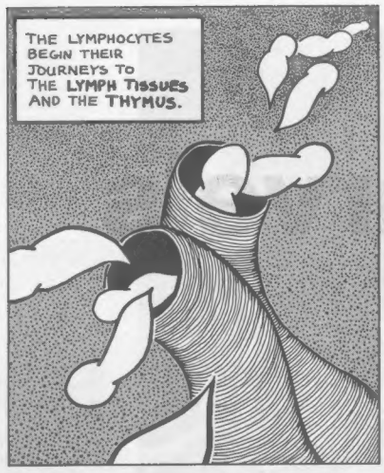
Surprisingly, our ideas about our individuality and self-integrity are paralleled by cellular "notions" of the same kind. For example, the decision whether a certain transplant will be accepted is made by a system in the recipient's body that is responsible for the maintenance of the body's self-integrity. This system is the immune system and it is charged, generally, with the task of protecting the body against invasion by any substances it considers foreign, whether they are microorganisms like viruses and bacteria, or the cells and tissues of a donated organ. The study of this system of self-defence is called immunology.

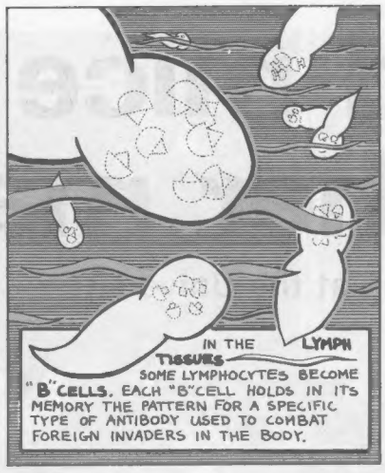
While doing immeasurable good for the body by eliminating or reducing threats to health and life, the immune system is a knife which cuts two ways. It is certainly the most important mechanism in our defence against the many foreign microbial invaders we encounter each day. It also, however, often interferes with many of the beneficial procedures of transplantation medicine.

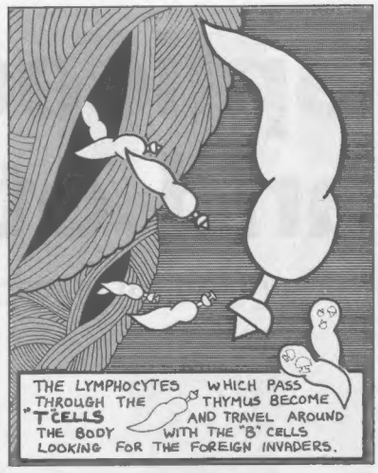
It is clear to surgeons and immunologists that transplanted tissue, of a heart for example, is meant to help the recipient despite the fact that it comes from another person. The body's immune system, however, does not see this; all it sees is foreign, non-self cells and

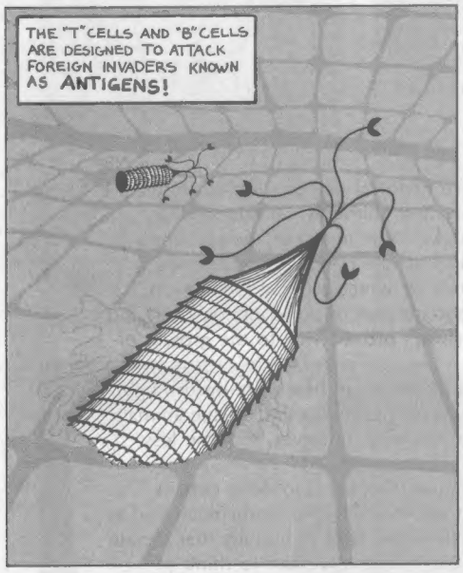
IMMUNE SYSTEM vs ANTIGEN INVADER

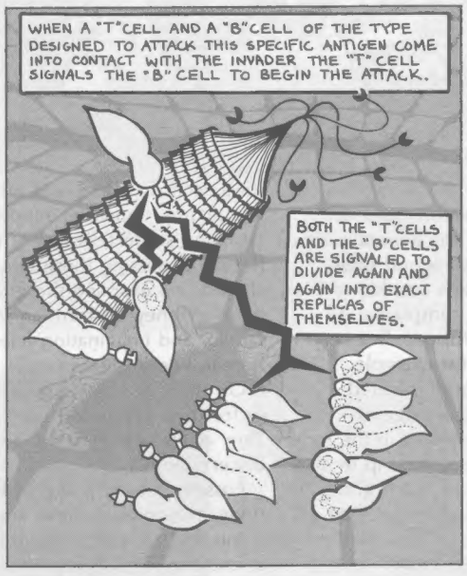
THIS IS AN ELEMENTARY EXPLANATION IN PICTURES AND WORDS OF THE BODY'S IMMUNE SYSTEM. THE DRAWINGS ARE NOT REALISTIC SKETCHES BUT IMAGINATIVE REPRESENTATIONS OF HOW THE SYSTEM WORKS. OUR STORY BEGINS IN THE BONE MARROW WHERE THE **STEM CELLS** ARE PRODUCING **LYMPHOCYTES.**

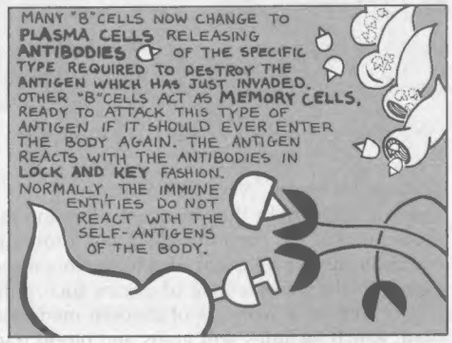


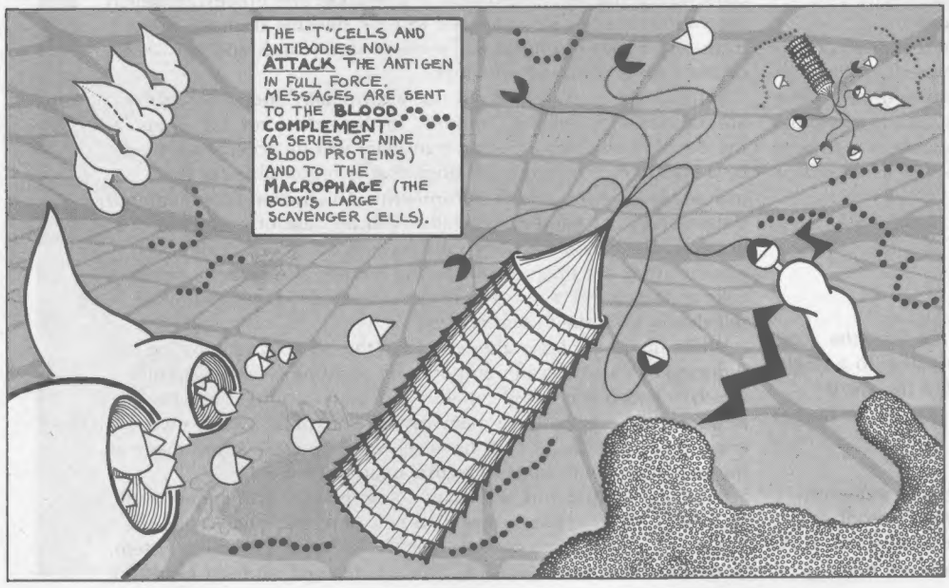


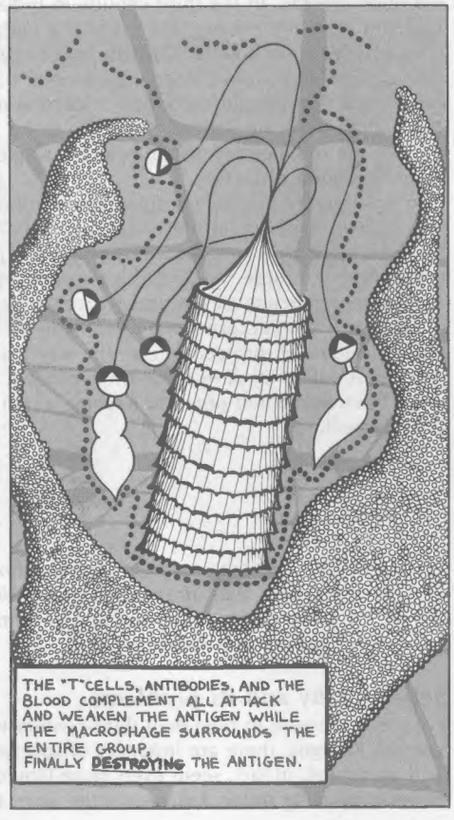












Drawings by Richard Kerr

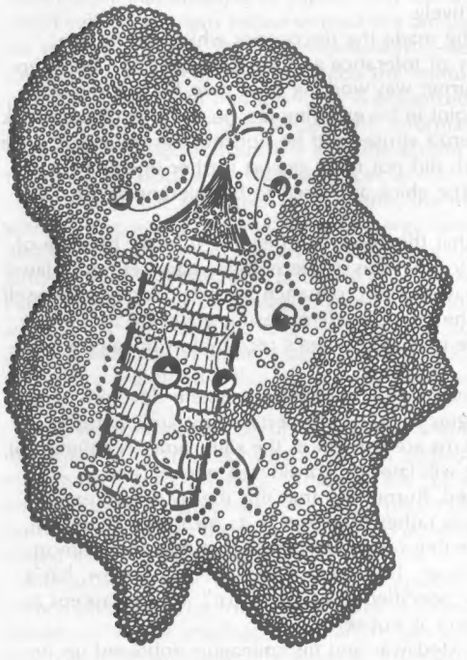
tissues, and it reacts accordingly to reject the transplant. The solution to the problem of rejection, the major difficulty of transplantation, lies in the study of the immune system.

If the beneficial functions of the immune system can be retained while, at the same time, the rejection response can be eliminated or diminished, successful transplants can be made. At present, there are ways of "knocking out" the immune system of the recipient so that donated tissue will be accepted, but this procedure, which involves the use of chemotherapy and sub-lethal doses of radiation, is not satisfactory. Once the immune system is impaired, the patient's body will not reject transplanted organs, but, unfortunately, neither can it defend itself against serious infection.

The ideal method of making transplantation successful would be to "shut off" the specific immune mechanism responsible for rejecting the transplanted organ and to leave the rest of the immune system capable of warding off infections. Before this ideal situation can be achieved, however, immunologists must understand the mechanisms of the immune system. They must understand the way in which the body recognizes certain things as self and certain other things as non-self, the way in which the body comes to accept its own organs and under certain conditions accepts non-self as self, and the way in which the immune system seems to suppress its own function at times (immunosuppression). The answers to these questions and others must come from basic research in immunology.

At the University of Alberta, the MRC Group for Transplantation Research is involved in finding solutions to the problems of transplant rejection. Established in 1970, the Group has as its goal the study of the immunological basis of rejection and the eventual control of the mechanisms that govern the body's rejection of foreign tissues and organs.

Research is divided into two areas: clinical and theoretical. J.B. Dossetor, Professor of Medicine, heads the clinical work, which involves patients who have undergone kidney transplants. Erwin Diener, Chairman of the Department of Immunology, directs the basic research, which concerns itself with experiments that accumulate facts from which theories about the immune system can be derived.



Often, animals are used as experimental models, and mice are the most common animals used. It has been found that the theories developed from experiments with mice are almost always valid in human application. One researcher in the basic unit of the MRC Group who conducts experiments using mice as experimental models is T.G. Wegmann, Associate Professor of Immunology. Dr. Wegmann's experimental models not only provide valuable information about the function of the immune system but are also fascinating in their own right.

Before we look at Dr. Wegmann's work in more detail, however, it is necessary to understand the context in which the work is done. It is necessary, that is, to understand in a general way the basic aspects of immunological research itself.

The singular character of the individual entirely dissuades us from attempting this work [the rebuilding of missing or deformed noses through skin grafts] *on another person. For such is the force and power of individuality, that if anyone should believe that he could accelerate or increase the beauty of the union, nay more, even achieve even the least part of the operation, we consider him plainly superstitious and badly grounded in physical sciences.*

Gaspare Taggliacozzi

The Mechanisms of the immune system

Long before birth, we are all stamped with a certain genetic uniqueness and individuality. Our self-ness is determined at the very basis of organic life (our hereditary material) and each of us exhibits unique and characteristic patterns that organize the substances which form our cellular selves (though we share many patterns with other living things). The macromolecular substances of all life are basically the same, although uniqueness arises in certain patterns of organization. For all intents and purposes, all living organisms are nourished by the same substances at the molecular level, and we find ourselves, therefore, in a struggle and competition with all life for those things that sustain life. The immune system is the main weapon of that struggle, for it is the mechanism that repels foreign invasion and thus maintains our self-integrity.

The immune system not only defends the body against microorganismic invaders like bacteria, viruses, and fungi, but it also protects the body against runaway cells within the body that produce cancer. The immune system also protects, much to the discomfort and annoyance of transplantation medicine, against grafted foreign tissues and organs.

The immune system is incredibly complex, but the main thing to understand is that there are two distinct (but not separate) ways in which the system responds to invasion by foreign entities called *antigens*. The two responses depend upon two sets of *lymphocytes* or types of white blood cells that arise from cells in the bone marrow.

One set of lymphocytes pass through the thymus (an organ located in the chest); they are then capable of responding to antigens in what is called *cell-mediated immunity*. These thymus-derived lymphocytes are called *T* cells. The other set of lymphocytes are known as *B* cells and are responsible for the production of *antibodies* (globular proteins) which react with specific antigens. *B* cells are the main agents of *humoral immunity*, which involves antibodies circulating in the blood and lymph. Cell-mediated immunity involves the *T* cells responding to invasion as whole cells.

On their surfaces, *B* cells and *T* cells carry specific antibody patterns which fit in a lock and key fashion with special places on the surface of antigens called "antigenic determinant sites." Each lymphocyte or antibody will react only with one specific antigen.

B cells and *T* cells reside in the lymph tissues of the body, and it is from these tissues that the cells circulate through the blood and lymph monitoring for the presence of invaders. When an antigen enters the body, the lymphocytes arrive at the site of the invasion; the antibody reactor sites on the surfaces of the *T* and *B* cells lock on to the antigenic determinant site on the antigen.

Both *T* cells and *B* cells begin to clone—that is, to divide again and again into exact replicas of themselves—to produce the specific entities to fight the specific invading antigen. The *B* cells begin to replicate after contact with the antigen and only after a message has been sent to them by the *T* cells. Without this message, *B* cells will not replicate and begin to produce antibodies.

Once the *B* cells form a clone, some of the cells begin to enlarge and become plasma cells, which are capable of producing the specific needed antibody. Other *B* cells from the clone go into a "resting state" and form the *immunological memory*. They have the specific antibody for the antigen which has just invaded and they remain in the body monitoring for the return of that antigen. Once a person has suffered an attack by a certain antigen, his memory cells equip him to withstand a second attack more effectively.

The specific antibodies produced by the plasma cells lock on to the antigens and clump the antigenic material together. This stops the antigens from spreading throughout the body and it makes it easier for the *macrophages* (large scavenger cells which are called in by the *T* cells) to ingest the antigens. Lymphocytes and antibodies can also call in the help of *complement* (a blood substance composed of nine major and several lesser proteins arranged in various sequences) which is capable of destroying antigens by, for example, cracking open the bacterial cell wall.

T cells are the main agents of the form of immunity that is responsible for the rejection of transplanted tissue, although in their role as suppressors and stimulators of the *B* cells, they also play a large role in humoral immunity (the rejection of viruses and bacteria). *T* cells, then, play a major part in the delicate system of checks and balances that is the working of the immune system. It is understanding this delicate system that the basic researcher in immunology has as his goal.

The immunologist of today, however, is not so much interested in finding out how to immunize people more effectively against diphtheria or poliomyelitis as he is concerned with understanding what happens when people become immune.

Sir Macfarlane Burnet

Self and not-self: the major question

Immunology is both an old and a very new science.
Its first "golden age" began with Edward Jenner's famous vaccination against smallpox in 1796. Jenner vaccinated people against smallpox by injecting them with serum material from cowpox sores; in fact, the word "vaccination" comes from the Latin *vaccinia* for cow. Later, in the nineteenth century, scientists like Pasteur in France and Koch in Germany discovered the role of microorganisms as agents of infectious disease.

In 1890, Emil von Behring and Shibasaburo Kitasato isolated an antitoxin against tetanus toxin, and soon tetanus and diphtheria were being treated by injections of serum containing the antitoxin. This sort of protection against disease is called "passive immunity"; the kind of immunity that Jenner created with his cowpox injections is called "active immunity."

The difference between passive and active immunity is that in the former the body is supplied with a temporary defence against disease from without, while in the latter the body is stimulated to produce its own defence against the disease. Research on the nature of immunity and prevention of infectious disease continued to flourish into the twentieth century. The main impetus for this research was to find means of generating active immunity against disease or else to develop passive immunity to carry the patient through critical periods in a given disease's development.

The second golden age of immunity, which is still continuing, began in the early 1950s when scientists began to focus their attention on the actual nature and operation of the immune system and away from the simple prevention of infectious disease. Immunity itself began to be investigated in much more particular ways which proved to have much more general applications in science and medicine. Immunology is now the fastest growing and most wide-ranging of all the sciences; its theories and principles are being used in an astonishing number of scientific and medical fields.

In the early 1950s, Sir Macfarlane Burnet and Sir Peter Medawar, both working separately on problems of the nature of immunity, made a number of significant discoveries about the ways in which the immune mechanisms act. For these discoveries, Burnet and Medawar were awarded a joint Nobel prize in 1960. Their discoveries and the questions that the discoveries raised are often credited with initiating the second golden age of immunology.

It was Macfarlane Burnet who first postulated the idea that the immune system was a mechanism that maintains the body's self-integrity by discriminating between that which is "self" and that which is "not-self." The body, by way of the immune system, obviously and violently rejects anything—virus, bacterium, cell or whatever—that is foreign to it. In a complementary way, the immune system does not attack and reject those things that constitute the body (except in extremely rare cases where the immune system appears to go wild and begins to attack self). The acceptance of self-constituents in particular and the acceptance of other substances generally, Burnet termed "self-tolerance" and "tolerance," respectively.

At the time that he made the discoveries which led him to formulate his theory of tolerance and the discrimination between self and not-self, Burnet was working on a cure for a common influenza. At one point in his experiments, he was inoculating chick embryos with influenza viruses and he noticed that the chick, once it had been hatched, did not react against further injections of influenza virus. The chick appeared to be tolerant of the the virus.

Burnet believed that the chick had become tolerant because of the early exposure to the virus in the embryo stage. He postulated that an organism may develop tolerance to certain kinds of not-self materials and that the critical early exposure might be the key to the operation of the immune system's recognition of self and not-self.

It is likely, he thought, that the immune system develops at a certain time and begins to recognize certain substance patterns as self if those patterns are present at the right time. Anything not present at that time will later be considered not-self and consequently rejected. Burnet felt that this theory would explain why the body accepts rather than rejects its own organs, tissues, and cells, while rejecting other substances that may have almost identical basic structures. The immune system, in this view, has a capacity, at a certain specified time, to "learn" what to accept as self and what to reject as not-self.

In England, Peter Medawar and his colleagues followed up on Burnet's ideas. Medawar had originally begun research in

immunology during the Second World War when he was part of a team trying to discover the reasons behind the erratic success rates of skin transplants performed on victims of the bombing of London. Medawar began testing Burnet's theories by performing skin grafts on rabbits.

Rabbits of one breed, a black variety for example, were injected with cells from another breed, a white variety, while still in the embryo stage. When the black rabbits that had been exposed to cells from the white rabbits were new born, skin grafts were carried out. Grafts were taken from the white rabbit breed and placed on the black newborn rabbits. Normally if skin grafts are attempted between black and white rabbits, the grafts are rejected and sloughed off in a matter of days. The grafts in Medawar's experiments, however, were successful. The black rabbit exposed to white rabbit cells had "learned" to regard tissue from white rabbits as part of self.

Further experiments proved the importance of exposure to foreign material in the embryo stage if tolerance was to be induced. This led to attempts to pinpoint the exact time of the development of the immune system. Other experiments by Medawar sought to determine the various factors involved in the process of tolerance and, thus, in the process of discrimination between self and not-self.

Today's science of immunology owes much to Burnet and Medawar and is still travelling down the path of investigation they first identified. How the body distinguishes self from not-self is still one of the major questions of modern immunology.

The phenomenon of tolerance is therefore of fundamental importance in the mechanism by which the body learns to discriminate between what is proper to itself and what is foreign. . . .
Sir Peter B. Medawar

Why we don't attack ourselves

One theory that attempts to explain why the organism does not reject self constituents (often termed self-antigens) can be summed up very succinctly as the "no-information-to-destroy-yourself" theory. A genetic code which directs the immune response is postulated. It is held that this code is organized in a certain way so that the organism is not provided with information necessary to destroy self-antigens. Thus, the immune system is incapable of mounting a response to the substances which make up the self.

This theory has a number of problems, the most important of which is the simple fact that, at times, organisms do begin to destroy themselves. Such cases of self-destruction are called the auto-immune diseases. This phenomenon was first identified by Paul Ehrlich, a German biologist, who called auto-immunity "horror autotoxicus." An example of a disease of this sort is hemolytic anemia; here the immune system begins attacking and destroying the body's red blood cells and the result is a severe and usually fatal anemia.

Auto-immunity often occurs later in life and may be connected in some way to an atrophying of the self controls and checks which exist in the immune system. Whatever the cause of the auto-immune diseases, however, their mere presence is enough to cast serious doubt upon the idea that the immune system is genetically coded not to destroy self-antigens.

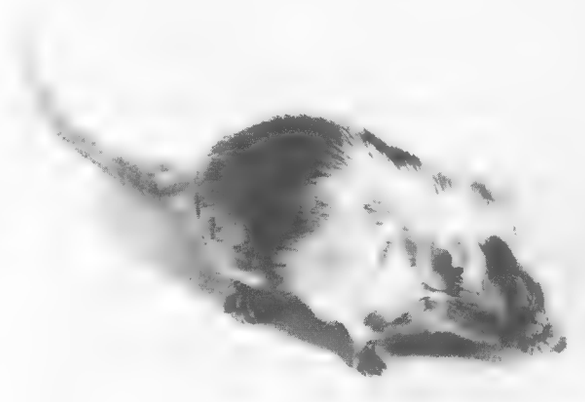
Macfarlane Burnet, the Australian immunologist, developed a theory which derived from his theories of tolerance. This theory is known as "clonal selection." It attempts to explain the way in which specific antibodies are made to react with specific antigens, and to explain why certain antibodies do not attack self-antigens. Put very crudely, this theory postulates that there is a vast and random production of antibodies in the embryo stage and that the antibody population grows through cloning or exact replication of cells by simple cell division. Each cell makes only one specific kind of antibody. In some way, it is thought, the lymphocytes (and hence the antibodies) that are capable of destroying self-antigens are paralyzed or blown apart when they come into contact with self-antigens. This process of destruction of the lymphocytes and antibodies that could attack self is called "clonal deletion" (simply the deletion of certain cells from the clone).

It has been shown, for example, that sometimes the immune system fails to go into operation because there are simply too many foreign antigens present. This swamping of the immune system by foreign invaders is called "high zone tolerance." Possibly something of the same nature occurs when the immune mechanisms, as they are developing in the embryo, come in contact with the huge number of self-antigens. Thus, it is thought that in this way the organism acquires a tolerance to its own organs and tissues: the self-immune mechanisms are swamped and wiped out and there are no entities left which are capable of mounting any sort of attack.

The clonal selection theory seems to fit well with a number of other immunological observations and occurrences. For example, it is possible to induce tolerance in experimental animals by injecting them with foreign antigens at certain stages of embryonic development (as Burnet and Medawar demonstrated). Also, fetal calf twins that share one placenta and thus experience a mixing of blood types, are found to readily accept skin grafts from each other after birth despite the fact that each calf has a different genetic make-up. The same thing happens with those rare cases where human fraternal twins have shared a single placenta: though each twin has a distinct blood type, each has antigens from the other that will be accepted as self. Such twins will accept blood transfusions and skin grafts from each other as readily as identical twins.

Once again, however, the existence of auto-immune diseases poses problems for the clonal selection theory and more seriously for the counterpart clonal deletion theory. If the clonal cells that have the capacity to destroy self-antigens are themselves destroyed early in the development of the immune system, where do the self-antigen destroying cells seen later in auto-immune diseases arise from?

Taking Burnet's theory of clonal deletion and making it more sophisticated, some immunologists have come up with the idea that instead of self-immune antibodies being destroyed outright, they are suppressed by certain mechanisms of the immune system. The self-immune cells would still exist and, therefore, would still be a potential threat to the body's self-antigens, but they are somehow



"taught" not to go into action. This is immunosuppression. When auto-immune diseases occur, it means that the suppression mechanisms have atrophied or failed to work properly and the immune system turns upon the body in a sort of civil warfare.

One of the most common and most striking varieties of immunosuppression occurs in the case of a very common "foreign invader" that is seldom thought of as such—the mammalian fetus. The fetus, because it contains antigens from both mother and father and has a make-up that is at least partly foreign to the mother, exists as a foreign entity in the mother's womb. Why does the mother's immune system fail to attack the father-derived antigens of the fetus? It is certainly not because the mother's immune system is not capable of doing so: by taking cells from the mother and antigens from the fetus and then reacting them in culture, the immunologist finds that the mother's cells act as if they were sensitized to the fetus's antigens. Therefore, the mother's immune system has the capability to attack the fetus, but does not. The reason should be obvious—it is fortunate for all of us that fetuses are not attacked as foreign entities. The important question then becomes *how* does the mother's immune system keep from attacking the fetus; that is, how does immunosuppression operate?

It is difficult to study the processes of the immune response and immunosuppression in the important embryonic stage. Therefore, immunological researchers devise experimental models that can be used to reveal the working of immunity and immunosuppression.

For example, one experimental model which is useful in testing the validity of the clonal deletion theory involves a mouse with four parents. Immunologists take a developing embryo at the eight-cell stage from a black strain A mouse and almost literally jam it together with a developing embryo from a white strain B mouse. The fused embryos are then taken out of culture and placed in the womb of an adult mouse that will serve as a surrogate mother, where the fused embryos become a single fetus.

When the mouse is born, it exhibits all the characteristics of each of its four parents and has components of each in each of its cells. It is called a "tetraparental mouse." This mouse is not a hybrid but rather a genetic mosaic. In many ways, it is a creature as extraordinary as any of the mythical fusings of beasts of different species.

The tetraparental mouse exhibits absolutely no signs of auto-immunity. This is significant insofar as normally strain A and strain B mice are violently incompatible. The tetraparental mouse's immune system, then, has learned to accept four different sets of antigens as self. Therefore, a tetraparental mouse can accept skin grafts, for example, from any one of the original parent mice. The presence of all the different antigens in the embryo stage induced this tolerance.

But how does this tolerance operate? According to the clonal deletion theory, all the immune mechanisms capable of reacting against the various antigens from the parent mice will be deleted or destroyed. Experiments with tetraparental mice, however, seem to indicate that the immune response has been suppressed, not obliterated. If one takes cells from a tetraparental mouse, puts them in culture, and then adds cells from one of the parent mice (one of the A strain, for example), an immune reaction sets in. The tetraparental mouse's B strain cell components mount an attack against the parent's A cells.

What this means is that the tetraparental mouse still has the capacity to mount an immune attack against the very things which it apparently has learned to accept as self. In some way, in the living mouse, the tetraparental's immune system is operating with a system of checks and controls which suppresses the immune response of antibodies and lymphocytes to those antigens which constitute self. In fact, if the tetraparental cells are put in culture with parent cells and there is a little serum added from the blood of the tetraparental mouse, no immune response takes place. Thus, there seems to be some mechanism at work which suppresses the action of the immune system. That mechanism is obviously a key part of the immune system and probably plays a very significant role in the maintenance of the self-integrity of the organism.

. . . most of all you need the intelligible basic facts to begin with, and these must come from basic research. There is no other source.
Lewis Thomas

Members of a modern bestiary: parabiotic mice

Now the important questions for immunologists revolve not around the existence or non-existence of immunosuppression, but around the actual way in which the suppression mechanisms operate. The tetraparental mouse may tell researchers that suppression is taking place and that the immune mechanisms remain active but are held at bay, but the important problem is *how* the immune mechanisms are held at bay.

One strange little creature which may provide a number of answers to that question is a mouse with two heads, two tails, eight legs, two hearts, and one circulatory system. This animal is known as a "parabiotic mouse." Actually two mice joined surgically along incisions from cheek to tail in each mouse, the parabiotic mouse is an example of a huge transplant—the grafting of a whole animal to another. T.G. Wegmann and a colleague, D.W. Drell, of the University's MRC Group were able to successfully parabios two adult mice with incompatible antigens. In other words, Drs. Wegmann and Drell found a way to overcome the barrier of individuality.

If two mice of the same strain, call it strain A, are sewn together, for example, there is no reason for an immune reaction to take place. Experimental mice have been inbred over the years so that all the mice of a single strain are like identical twins in that their genetic patterns are identical in all the areas of the molecular structures that count in an immunologic response.

In using the parabiotic mouse as an experimental model, Dr. Wegmann feels that it will be possible to "study the *on* kinetics of tolerance, the *off* kinetics of tolerance, and the waning of tolerance as well." That is, the researcher will be able to study the operation of immunosuppression and the role it plays in tolerance. By understanding this, it may be possible to control the rejection response in transplants.

From the experience of transplantaion operations involving humans, transplantation specialists know that histocompatibility is all-important to the success of the transplant. Histocompatibility is the genetic compatibility of donated tissue to recipient tissue. Thus, the source of rejection or tolerance lies in the genetic make-up of the individuals involved. For example, if a transplant donor is an identical twin, the transplant normally takes; if the donor is a sibling, the transplant has a better chance of success than if the donor is a non-relative.

These rules are, however, uncertain at best because the exact genetic loci of tolerance and rejection have not been located. Methods of tissue typing have been developed. Tissues are typed according to the kinds of white blood cells present; if the cells are similar to the white blood cells of the recipient, the graft is thought more likely to be a success. This system, however, is not failure proof.

The best way to overcome the rejection response would be to find the actual genetic basis of the recognition of self and not-self. If immunologists could locate the exact part of the molecular structure of tissue that stamps the tissue as unique, there is a

possibility that that part of the molecular structure could be "masked" or altered in some way to prevent the recipient's immune system from recognizing it as not-self. In this way, the immune system could be turned on or shut off at will. Dr. Wegmann's experiments with parabiotic mice are helping to focus on the genetic bases of self and not-self identification, and uncovering the ways in which tolerance and rejection operate.

Initially, if a strain A mouse is grafted to a strain B mouse, the immune systems of each mouse erupt into activity because the two strains are incompatible. The A mouse's system recognizes the B mouse's cells as not-self, and likewise the B mouse's immune system recognizes the A mouse's cells as not-self. The immune systems of each form antibodies against the other and the mice begin to kill each other.

To get around this, a strain A mouse and a strain B mouse were mated by Dr. Wegmann. The offspring was thus a hybrid type A/B. When the hybrid type A/B mouse was surgically joined to the strain A parent mouse, the immune reaction that set in was different from the one that set in when a strain A and a strain B were joined.

The A/B mouse recognizes both antigenic constituents of each of its parents as self (just as all offspring do). The immune system of the A/B mouse, therefore, will not mount an attack against antigens of the A mouse it is parabiosed to because it recognizes A cells and tissues as part of self.

The A mouse's immune system, however, will mount an attack against the B component's of the A/B's cells but will not attack the A cell components which are similar to itself. The immune reaction, therefore, moved only in one direction in the parabiosis. The A mouse attacked what was foreign in the A/B mouse.

The immune reaction is thus not only one directional and much easier to observe and to determine what is happening, but the reaction is directed against only one element of the A/B mouse. The survival rate of the parabiotic combinations leveled off at about 50 percent after a few weeks. This result is remarkable. In the parabiotic mice that survived, the A mouse's immune response to the A/B was not overpowering enough to kill the A/B mouse. Apparently, if the mice lived past a certain critical point, the A mouse became tolerant to the A/B antigens. In fact, the A mouse would even accept skin grafts from other A/B mice. For some reason and in some way, the normal immune reaction had been blocked or shut off, and tolerance had occurred.

The agents of immune response, however, were still active in culture although they were suppressed in the living mice. One interesting sidelight in the experiment was the discovery that the circulatory system of the A mouse completely took over the circulatory system of the A/B mouse. The two mice have, in effect, one circulatory system. Dr. Wegmann and his colleagues have termed this take-over "cellular imperialism."

Since the mice used in these experiments are of relatively pure strains, with well known and certainly identified genetic make-ups, it is possible for the immunologist to "tinker with" the genetic configurations of mice involved in parabiosis to locate the exact genetic locus of rejection and tolerance.

Dr. Wegmann took the 50 percent survival rate and attempted to manipulate it in other experiments with A and A/B mice. For example, it is possible to change the genetic structure of the A/B mouse in just one area to create an A/B^1 mouse. This A/B^1 mouse will then be grafted to an A strain mouse. The survival rate for this parabiosis will differ from the simple A and A/B graft. Another area of the genetic structure can be altered in another mouse and a hybrid A/B^2 will be created. This mouse will be parabiosed to an A mouse, and once again the survival rate will vary. By such manipulations, Dr. Wegmann can begin to determine which areas of the genetic pattern cause survival rates to change, either for good or for worse. This allows him to zero in on the exact area of genetic control of rejection and tolerance.

Once this is achieved, it will be easier to understand how the immune system is turned on and off, with the result that various kinds of transplantation operations can be made more successful through manipulation of the mechanisms of immunosuppression.

Another area of research which is being undertaken in the basic research unit of the MRC Group is importantly connected to this work in the on-off functioning of the immune system. Erwin Diener is working on the molecular nature of the signals that turn immune cells on and off and how these cells interact with the cell membrane. Although these studies are carried out largely in test tubes (for stricter control) the eventual aim is to link these studies with what happens in the complex animal system. One example of such a connection is the construction of molecules (based on test tube experiments and theoretical considerations) which are designed to cure a certain auto-immune disease in mice. This disease closely resembles a fatal auto-immune disease in humans. These constructed molecules easily cure the mouse disease, and they will eventually be tested clinically for their effectiveness in treating the human disease.

The curing of human disease is always the distant aim, of course, but there is much work yet to be done in immunology that seems very remote from actual, practical medical concerns. Dr. Wegmann's work with parabiotic mice may provide, for example, an excellent model for successful bone-marrow transplantation. If researchers can discover how it is that one mouse's circulatory system takes over the other's without a graft-versus-host reaction setting in (that is, how the imperialist cells do not set about killing the other mouse), significant advances could be made in bone-marrow transplants. Despite such future clinical applications, however, the importance of Dr. Wegmann's work and the work of the rest of the researchers in the basic unit of the MRC Group is to amass the "basic intelligible facts to begin with."

St. Joseph's College 1926 - 1976

By. C. Gordon-Craig
Dean of Men in St. Joseph's College
and Associate Professor of English

St. Joseph's College is probably one of the most familiar but least known buildings of the University. Situated in the centre of the campus, nestled between its sister-institution St. Stephen's College, the Administration Building, University Hall, and the Students' Union Building, its mellow facade fronted by lawn and trees, it is at one and the same time taken for granted and the subject of many mistaken impressions. Ideas of its nature range from the commonly accepted (but incorrect) notion that "only priests live there," through allied concepts, "only students who want to be priests live there" (equally incorrect), to the wilder views, "I always thought it was just professors' offices." Currently celebrating its Fiftieth Jubilee as a physical entity on campus, St. Joseph's is the Roman Catholic College on campus, home to seventy students during the academic year, the centre of the Roman Catholic community associated with the University, and the alma mater of several thousands of alumni who have lived or been taught within its walls since 1927.

While the actual credit for the inspiration for the foundation of a Roman Catholic College to be affiliated with the University of Alberta must go to Archbishop O'Leary, a former Archbishop of Edmonton, the moving spirit associated with the practical achievement of that goal was Fr. John R. MacDonald, later Bishop of Antigonish, Nova Scotia. It was Archbishop O'Leary who saw the need and negotiated with President Tory and Dean Kerr in 1921 towards the affiliation of the proposed College, and it was the Archbishop who arranged for Fr. MacDonald to come to Edmonton to promote and organize the establishment of St. Joseph's College. Not only did Fr. MacDonald do just that, but he firmly settled its initial financial basis by securing a grant of $100,000 from the Carnegie Corporation. Fr. MacDonald left Edmonton in 1923, but the stage was set. On March 18, 1926 the Provincial Legislature established St. Joseph's College as a real entity, the University gave the site, and the cornerstone of the building was laid not long after. The building was formally opened in late 1927, the first year that students were admitted to it. Fr. MacDonald also was instrumental in the foundation of the Newman Club, the social organization for Roman Catholic members of the University community, which technically antedates the College itself in that it began in November 1923 though initially housed off-campus, a far cry from the present Centre now located in the basement of the West Wing of the College.[1]

The internal arrangements of the building have changed somewhat over the years. For a long time the dining room was underneath the Chapel with the obvious feature that everyone at Mass knew much of the dinner menu in advance, the boiled cabbage being usually the most pervasive item. Yet it was "Little Tuck" that for close to forty years was to be the best known part of the College to the University at large. "Big Tuck" held its time-honored location opposite St. Stephen's, but in the basement of St. Joe's was a small cafeteria selling coffee and assorted eats such as

Opposite, *Archbishop O'Leary and Henry Marshall Tory, the University's first President, lay the cornerstone for St. Joseph's College on a chill day in 1926;* above left, *later that year, the College under construction.* Left, *a memorial service in St. Joseph's Chapel in the late 1930s for Archbishop O'Leary.* Above, *the Chapel spire.*

doughnuts and pies. The two tuckshops were the only places on campus where one could buy something simple in the way of food and where one could socialize casually in a relaxed atmosphere at the same time. Since "Little Tuck" was chummier, cozier, and not quite so noisy as "Big Tuck" it was justly popular with many from all disciplines of the University.

At the east end of the College are the classroom wing and the Gym. From the first, the College has always been empowered under its Charter of Affiliation to offer courses in certain areas for full credit in the University of Alberta, so that adequate classrooms were a necessity. Underneath them is the Gym, originally one of the very few available on campus. Legend has it that the Gym was excavated with the intention of its being a swimming pool but that an official protest was made by some unknown party that it could lead to *mixed* bathing and that it was thought best finally to turn it into a gymnasium. Whether the yarn be true or not, certainly the Gym has received much use as the scene of various athletic activities, from a great amount of handball in the earliest years to boxing, phys ed, and the perennial floor hockey. One of the few periods when the Gym was not used in its other role as a dance floor was during World War II when that aspect was felt to be out of keeping with the spirit of the times and, in any case, students at the University during the Second World War were largely preoccupied with their studies to the exclusion of much else. Perhaps the years following the war saw the most celebrated dances held in St. Joe's: the Newman Club's famous St. Valentine's Day dances, or the big dances on Hallowe'en and at Christmas, and, of course, one of the campus events of the year, the St. Joe's Annual Formal with its celebrated punchbowl that was always strictly non-alcoholic but by equally invariable tradition clandestinely well-spiked.

The College was administered by the Christian Brothers until 1963 when they were succeeded by the Basilian Fathers. As early as 1920, Archbishop O'Leary had looked to the Basilians in the hope that they might establish a College in Edmonton but they had had to decline through lack of manpower. Under the Christian Brothers the College held rather more than the present number of residents, many of the currently single rooms having housed two people, a few providing accommodation for three. Even the broom closets were not immune from being pressed into service as need might require: in the early fifties a student not in full-time attendance on campus could sometimes have the occasional use of the small janitor-room on Second Floor West as a bedroom for fifty cents a night. The luxury of having a room with a sink used to cost an extra dollar a month.

Naturally, attendance at Mass was encouraged and for a number of years the custom existed that one or more of the Brothers would go through the building rapping on every door to wake the students up in time for the service before breakfast. The Chapel was, however, the most inadequately heated part of the whole building and in winter it was not at all uncommon to see the students wearing their toques for sheer warmth during the liturgy.

Left, *the entrance to St. Joe's before the College was renovated in the mid-sixties, when scaffolding (above) decked the stripped out entrance hall.* Right, *laughing faces at one of the famous post-war Newman Club St. Valentine's Day Dances.*

The meals generally seem to have been well thought of even during a period in the late forties when the fish served on Fridays achieved a distinct notoriety, the students preferring almost to a man to dine elsewhere than in the College on those days. Indeed, one brave soul is reported to have reached such a point of desperation as to have told the Rector that he was "prepared to die for the Faith but not for the fish."

The students seem to have been generally hard-working and the hours from seven to ten each week-night were set aside as a study period. At ten, many would go downstairs for coffee in "Tuck." Woe betide those who disturbed the set study period: the House Committee met usually about once a month as a kangaroo court to mete out justice and fines. There were, of course, the expected pranks and capers, the usual raids and snowball fights between the residences on campus, but surely there is little to compare with the memorable occasion in the second year the College was open, when one of the residents returned to find all his furniture removed from his room and rearranged neatly over the peak of the topmost central roof, a considerable feat of translation and requiring some agility as anyone who has been up there, even unencumbered, will readily attest.

Gone is the potato patch at the back of the College, the root cellar is no longer, nor is there still the old garage that used to be home to all the dozens of cats, though some of its bricks now surround the pillars in the students' lounge. Perhaps the greatest changes took place in the mid-sixties when the interior of the College was thoroughly renovated. At the same time, a new library was established in the East Wing through the kind aid of a substantial donation from the Knights of Columbus of Alberta. The most striking alteration, however, has been to the College Chapel where the old altar and pews have been removed, the windows in the south wall blocked up and much else remodelled. The Chapel is the spiritual heart of the College and the symbolic focus of the life of its community. As a Christian College in the University of Alberta, St. Joseph's College depends on the trust and support of many elements: it has flourished for fifty years, may it thrive for many more.

Notes

[1] For this and all other details of the history of the College before 1927, I am indebted to the Rev. Peter A. Nearing, who has kindly allowed me to make use of his paper "Rev. John R. MacDonald, St. Joseph's College and the University of Alberta," which was delivered by him at the meeting of the Canadian Catholic Historical Association at the University of Alberta, 3 to 4 June 1975.

I am especially grateful to the following alumni of St. Joseph's College who have helped me with their recollections of life in the College: Mr. Francis P. Flanagan; Dr. P. J. Kimmitt; His Honour Judge Lucien Maynard.

Further to "Student Finance: Bonus or Burden?"

New Trail doesn't usually print letters to the editor (although maybe it should). However, we thought this was a special case. Although we would be interested in further reader comments on this subject, and especially on their own experiences with student finance, we can't promise to print them.

Dear Editor:

In the January issue of *New Trail*, an unfortunate article entitled "Student Loans: Bonus or Burden" was presented by Sylvia Vance. In preparing this article, the author sought no information from the Awards Officer, Mr. Henderson, who represents the major link between the Students Finance Board and the University of Alberta. In addition, she did not contact the Students Finance Board for information or factual evaluation of her article. Finally, she did not avail herself of the information on Students Finance Regulations contained in the Law Library at the University and in the Legislative Library. The result is an impressionistic, inaccurate misstatement of the programs administered by the Students Finance Board, and the Provincial Government policy regarding student assistance. This forces me to clarify at least three major (and erroneous) impressions created by the author.

First, the author implies that "Our prosperous and progressive Alberta Government" is not responsive to the needs of its students. The author wrote this in January 1976—fully six months *after* new regulations were approved and implemented by the Alberta Government. These regulations: increased the maximum remissions benefits to 50 percent; increased the value and number of undergraduate scholarships; increased the value and number of graduate fellowships and scholarships; provided for a part-time bursary program; liberalized the residency requirements; and granted the Students Finance Board even greater flexibility in helping students. These changes were publicized by the Government in newspapers and on television, and all regulation changes are published in the *Gazette*. Immediately upon approval of the regulations, the Board held briefing sessions with representatives of every major post-secondary institution in Alberta. In November, the Board held another meeting with all of the Awards Officers to further discuss the changes and to handle any problems. Mr. Henderson, representing the University of Alberta, was in attendance.

Secondly, the author implies that the Students Finance Board cannot supply "a statement of policy." The Board supplies legislation, regulations, and policy statements to anyone requesting them. (We recently provided a *Gateway* writer with summary information on awards to all students in Alberta, and would furnish such information to any member of the public who requested it.) Board policy statements are extremely formal and are public information. The Secretary to the Board informs me that, to his knowledge, there has been no request from Mrs. Vance for policy statements.

Lastly, regarding appeals, the author does the Students Finance Board a great injustice by saying ". . . no student can easily appeal what may have been an arbitrary decision." The Board has a completely autonomous appeals structure. The appeals committees, in Edmonton, Calgary, and Lethbridge, are composed totally of private citizens and student representatives. These committees meet in the late afternoons and evenings (for students' convenience) to hear appeals. Students are informed about appeals procedures, in writing, with every award. The appeals guidelines, developed by the board, allow for either written or oral notice of appeal. No employee of the Board (not even the Chairman!) can prevent a student from appealing, nor can they alter or overrule the committee's decision. Copies of our appeals guidelines are available from the Students Finance Board upon request. The author did not request them.

Mrs. Vance does focus on some important issues. Matters such as debt and the plight of the student who is a single parent are of great concern to her and to the Board. In regard to the former, we have increased our counselling activity; implemented more stringent savings requirements; screened all initial applications for debt potential; initiated selective performance evaluation to assure that the students are progressing in their programs; and requested (successfully) that the Province increase their remission benefits.

The students who are single parents are supported upon recommendation of a committee comprised, primarily, of professional community workers. They evaluate each student and tailor the assistance to the student's portfolio—taking into

consideration the number and ages of the dependents, child support payments, real property, and other factors. The committee then may award grant funds up to a maximum of $4,000 per year per student, in addition to loans and remission in order to create a reasonable level of repayment for each student. This committee is very much concerned with helping these students toward realistic and attainable educational goals leading to self-support. My experience in this area leads me to believe that the fundamental problem facing single parent families is not educational opportunity . . . but child support.

New Trail, a publication whose readership is made up of university educated people, should always exemplify the highest levels of journalism. Readers accept that statements made in such a publication are factual. Instead of fact, however, Mrs. Vance has presented myth and misinformation. Those who know the students assistance program in Alberta will have already discounted the article, and I hope that those who wish to gain an understanding of student assistance will do what Mrs. Vance did not . . . get the facts by contacting Mr. Henderson in the Awards Office or by getting in touch with the Students Finance Board.

Yours truly,
R. Davy
for Mr. P.A. Tietzen,
Chairman, Students Finance Board.

The purpose of the article "Student Loans: bonus or burden?" was intended to be positive. In general, it suggested that students might be wise to consider the implications of incurring a severe debt and the responsibility that such a debt implies. As well, the article undertook to examine the difficulties involved in repaying a student loan and the way in which these difficulties might be avoided.

Although Mr. Tietzen's complaints are directed, with the exception of that regarding single parents, to the last paragraph of the article, I feel that they are serious enough to warrant response.

In fact, I did contact the Student Awards Office. They referred me to the Student Finance Board since the information they had was outdated. The Student Finance Board was contacted *on a number of occasions.* At no time was the author offered or referred to Student Finance Regulations contained in the Law Library and in the Legislative Library.

All of the information provided in the last paragraph of the article regarding student loans and remissions was supplied by staff of the Student Finance Board. It can be seen from the "instances" given regarding remissions that, if a student wanted to appeal a remission, she would have difficulty perceiving the grounds on which the remission was granted.

It should be noted, at this point, that the author has always been treated fairly by the Student Finance Board. Requests for a loan were responded to promptly and the remission received was just. However, on enquiry into the basis for the remission, I was given conflicting explanations on two separate occasions.

New Trail staff does try to "exemplify the highest levels of journalism." However, we are not investigative reporters, and we can only presume that the information given to us is correct and factual.

Sylvia Vance.

among our alumni

Joe Clark

by F.W. Samis

Bill Samis, former New Trail *Editor, is Executive Assistant to the Alberta Minister of Consumer Affairs. He is an old chum of Joe's from his* Gateway *days.*

For Walter Johns, detente with the provincial politicians was a matter of urgent daily concern. In 1959, he was the new President of one of Canada's fastest growing universities. He was perhaps the hungriest man at the Provincial Treasurer's door—and that Honourable Gentleman was a member of a government populated with worthy citizens suspicious of Socrates, Darwin, Freud, city morality, and the excesses of youth.

It was bad enough for Joe Clark to be publishing pictures of the Legislative Building with "Dead Slow" in large letters in the foreground—"the camera never lies" Clark would claim when asked about the photographer's juxtaposition of the traffic sign and the subject matter.

But in those undergraduate years when we all see the world a little more fully than before, Joe became an avowed critic of mediocrity. It galled him that Alberta was referred to as the Alabama of Canada. The credit for the Alabama image and the Alabama mentality he laid firmly on the steps of the "dead slow" Alberta Legislature.

Later he would work very hard to defeat that government. But as an undergraduate he confined himself to being only slightly larger than life—to wheeling a bust of Goethe (filched from the Arts Building) through the Rutherford Library in a grocery cart, to the accompaniment of flourishes and skirmishes orchestrated by *Gateway* columnist C.D. Evans (now a Calgary lawyer and masquer)—to publishing a lampoon edition of *The Gateway* that scandalized some of the best people in government circles and put the Provost, Aylmer A. Ryan, at some pains to keep Joe from being expelled—and when Joe left the campus, to hosting a boozy farewell party for his friends at which he was the only teetotaler.

Joe came to *The Gateway* with an honest tradition of spunky Alberta journalism behind him. His grandfather came to High River in 1905 and bought the *Eye Opener* from the redoubtable Bob Edwards. Edwards was under some compulsion to leave town quickly. Grandfather Clark renamed the paper *The High River Times.* Although he gave the paper a more sober character than his predecessor, neither he nor his son, Joe's father, lost any of Edwards's tradition of castigating fools in high places. *The High River Times* became one of Canada's foremost weeklies, in content and appearance, and it is in its office and composing room that Joe grew up.

Joe may rank his *Gateway* foibles among his best accomplishments in academe. However, his scholarship was not unnoticed by the Political Science Department who later invited him back as lecturer in Canadian Government.

Between and during episodes of study at this and other universities, Joe was a working journalist for the principal Alberta dailies and the CBC. But his career as a correspondent was forever being interrupted by calls to political work—when he was seventeen as secretary to Alberta Conservative Leader W.J.C. Kirby, later as Director of Provincial Organization to Peter Lougheed, and then as an aide to Davie Fulton and Robert L. Stanfield.

He ran in the provincial election in 1967 in Calgary. That was four years before the first Lougheed sweep, but Joe came frustratingly close to defeating the Speaker, Art Dixon, himself a hard-working candidate and MLA. Since then there have been

three campaigns—the federal election in 1972 where he defeated the sitting Liberal (by 5,011) in Rocky Mountain and earned himself a seat in parliament—his re-election with a doubled majority two years later—and the cliff-hanger in front of the television cameras in the Ottawa Civic Centre in February.

His Opposition, to recall *Gateway* days, was no longer unofficial.

He entered all but the 1974 contest the dark horse—the young underdog with "no chance". The press and the pros now claim (admiringly) that it was hard work that won for Joe. That is undeniable. But more than that, it was his good humor that carried him through—a manifest charm in the face of adversity.

Anyone who has worked with a successful politician, particularly a young one, has met lots of people who like to tell you, confidentially when the candidate is out of the room, "you know, I really had to show Joe the ropes" on this or that. "He was pretty naive until I gave him a few tips." It is one of the marks of Joe's character and charm that there are hundreds of people in Alberta and Canada who honestly feel that they have given Joe counsel on some delicate matter.

Not only does Joe tolerate these indignities gracefully, he seems to encourage them.

He has a genuine commitment to a type of politics where the politician is a partner with his constituents, and he is prepared to pay the price of listening.

For example, the Editor of the *Edmonton Journal*, Andrew Snaddon, regularly tells that paper's long-suffering subscribers that when Joe first got a summer job as a reporter, he wore a hat on the back of his head in the manner of Hollywood reporters, and that he told Joe that real reporters didn't wear such headgear.

I have to say that I have never given Joe any useful advice, or at least any which he has followed. Indeed, it is all the other way. When Joe was Editor Emeritus of *The Gateway*, and I was a freshman reporter, he was fixing up the grammer in my copy. Years later, when I helped with his campaign literature, he was still agonizing over and correcting what I had written.

With his wife, Maureen, I have had more success. In the hectic weeks before the leadership convention, Joe ran out of shirts in Edmonton. Maureen used our washing machine, and I lent her the soap.

It is not very original for students to refer to a classmate who has some political ability or aspiration as "Prime Minister." We often said that of Joe. "Your turn to buy coffee, Prime Minister." But in the years since, Peter Hyndman and I have agreed that never once did we call Joe "PM" to tease him. For all of his wit and good humor, we saw in Joe too much singleness of purpose to do that. We were just getting used to the title—just practising for the finals.

campus reporter

Tuition Fees Increased 25 Percent On February 6, 1976, the Board of Governors of the University of Alberta voted to approve a 25 percent increase in tuition fees. Only those members of the Board who are students were opposed.

The Provincial government operating grant to the University for 1976-77 was to exceed last year's grant by only 11 percent. This meant that a $2.5 million deficit was inevitable in a budget which had been planned to only maintain current levels of operation. Despite restraint measures, the projected University budget for 1976-77 indicated an increase in net expenditures of 11 to 12 percent. The actual increase in University revenue indicated by the government's 11 percent increase amounted to only 9.7 percent. Therefore, the University was forced to find other means to provide extra funding.

The provincial government gave approval for the Universities of Lethbridge, Calgary, and Alberta to increase tuition fees. These Universities reached a tentative agreement to increase tuition by 25 percent, and though this increase exceeds the Federal government's anti-inflation guidelines, the provincial government took the position that tuition fees would not be subject to those guidelines.

The increase in tuition, of course, met opposition from students. On February 6, during the Board of Governors meeting, some 2,000 students demonstrated against the increases. The demonstrators gathered outside University Hall where the Board meeting was taking place, and at a break in the meeting, Harry Gunning, President of the University, and E.A. Geddes, Chairman of the Board of Governors, came out to address the crowd.

The Graduate Students' Association suggested that all members of the University community be asked to bear a portion of the budget deficiency. In the brief submitted by the GSA, it was suggested that fees be increased by 10 percent and that salary demands of University staff be reduced accordingly. E.A. Geddes replied, however, that the Non-Academic Staff of the University had already shared in the University's financial burden by accepting salaries which had fallen significantly behind those paid to their counterparts in the Civil Service.

When Graeme Leadbeater, President of the Students' Union, suggested that more pressure be brought to bear on the Provincial government to assist the University, Mr. Geddes replied that appeals had already been made and that the government was unwilling to yield on the 11 percent ceiling. He also emphasized that protests of a stronger nature would not be in the best interest of the University.

University Research Income Research income received by the University from various granting sources passed the $10 million mark for the year ending March 31, 1976. This amount was reached owing to an increase of 20.1 percent over last year's total. The University has fared well in the competition for available research funds; in relation to other universities, the University of Alberta has maintained its rank in terms of funds received compared to last year.

Nevertheless, University research budgets will be hard pressed. According to G.A. Holmes, Research Grants Officer, the 20.1 percent increase in funding over last year will help to offset the "inflation which is eroding the purchasing power of the research dollar." The levelling off in the budgets of national granting agencies plus the effects of inflation, however, have had damaging effects on research at the University. For even though the National Research Council, for example, has increased its granting budget by 7 percent, the dollar has decreased in value at about a rate of 6 percent; the actual overall purchasing power of the research dollar decreased by about 20 percent.

Enrolment Quotas in Engineering The Board of Governors approved a request from the Faculty of Engineering to limit enrolment in the first and second years, 520 and 415, respectively of the undergraduate program. Approval was given for a period of one year only. The situation will be reviewed in the spring of 1977 to determine whether quotas will continue.

Approval related to the numbers only. Implementation of the quotas including selection criteria will have to be decided by General Faculties Council.

The reason given for establishing enrolment quotas in Engineering was that freshman enrolment had risen sharply in 1974-75 and even more sharply in 1975-76. However, the number of teaching staff has not increased to accommodate the increased enrolment. As a result, the student to faculty ratio in Engineering has risen to 12.4:1, the highest in Canada and one of the highest in North America. The prediction was made that this would increase to an intolerable level of 13.5:1 by next fall if no alternative was found.

Schools Become Faculties On March 29, 1976, the University received a letter from A.E. Hohol, Minister of Advanced Education and Manpower, endorsing a decision by the Board of Governors to designate four schools as faculties. The schools of Home Economics, Library Science, Nursing, and Rehabilitation Medicine are now faculties.

Ellerslie Research Station Fire On Tuesday, January 20, 1976, fire completely destroyed one of six long barns at the University's Ellerslie Research Station. Of the forty-four cattle housed in the barn, one was killed in the fire and fifteen had to be destroyed as a result of injuries. Another twelve animals were treated for burns.

The sixteen pregnant cows lost in the fire were from the synthetic herd developed at the University Ranch at Kinsella; half of these cows were of a particular genetic strain being used in a unique research project into cattle genetics. The market value of the cattle lost was around $4,000, but the research value was termed "immeasurable."

Native Affairs Adviser Marilynne Buffalo MacDonald, the Native Affairs Adviser, has been working to assist native students attending University and those who wish to attend, and has been acting as a liaison between the University and the native community. Working with Student Counselling, Student Awards, the student services of individual faculties and schools, and the high school liaison division of the Office of the Registrar, Ms. MacDonald hopes to make native groups more aware of the resources of the University and, in turn, to make the University itself more aware of the native community and what it has to offer.

Wild Oat Study In the last issue of *New Trail*, it was erroneously reported that "41 percent [of the grain shipped from prairie farms] is wild oats." This figure of 41 percent refers however, to *dockage* at the terminals; dockage is the portion of the grain comprising weed seeds, dirt, and other debris. Therefore, of that dockage, 41 percent is wild oats. Also, $9 million is not a very fair price for 350 million bushels of grain of any kind; the figure should have read $900 million. We thank William Vanden Born, Chairman of the Department of Plant Science, for pointing out and correcting these errors; we also thank the *New Trail* readers who humorously questioned the erroneous figures.

HUB Transferred. An agreement has been reached between the Board of Governors and the Students' Union transferring ownership of the HUB complex (the Students' Union housing complex) to the Board. This is a preliminary agreement with a master agreement to be reached by June 30. The transfer will make available for other purposes that portion of student union fees previously needed to subsidize the operation of the HUB complex.

Book Review

The Spice of Life by Sir William Mitchell, published by The Bodley Head Limited.

The author doesn't fit the stereotype of a contemporary entrepreneur. Heir to family fortunes in mining, he worked with men in the pits; a Conservative, he is not dogmatically opposed to state ownership. He has sought out and recognized "fine commercial propositions"—at seventy-four he was still "active in seven countries." But he also tries to understand those aspects of Western civilization which have caused the rebellion of youth.

Of special interest to alumni is the Mitchell family's participation in the development of Alberta's energy resources. When the railway was built through Yellowhead Pass there was urgent need for coal. Sir William's father formed a company to develop leases found in the Rockies by a trapper and a railway engineer. Mountain Park was established and in 1921 an adjoining mine was opened: Luscar, named after the family home in Fife. In the mid-1940s "prospects for the coal industry in Western Canada appeared to be increasingly poor." It was being replaced by oil. Sir William and his brother were soon involved with the spectacular development of Alberta's oil and when Japan needed coking coal for expanding its steel production, Sir William's companies met the challenge, shipping coal over the Rockies and 6,000 miles across the Pacific.

The author is deeply concerned about the problems facing us in "this age of dramatic change." One of these is the need for education in the developing nations; another is the proper use of the land. But priority must be given to the need for population control. ". . . the future of the whole human race turns on whether, having exterminated or enslaved so many other creatures, it can now hold its own expansion within reasonable bounds." But quite apart from a careful examination of these vital matters, the memoirs can be enjoyed as a fast-moving tale of travel and adventure.

the alumni

'24

A bit of interesting Canadiana is wrapped up in **Janet McLaren Cook**'s, *BA*, first book *Through Cloud and Sunshine*, published by Southern Printing Company, Lethbridge. **Cliff Stacey,** *BA*, was named to the Alberta Agricultural Hall of Fame recently for his inspiration and work in providing a lasting and outstanding contribution to the development of agriculture, industry, and life in the province.

'27

Highly regarded throughout the agriculture industry and particularly by the Unifarm organization, **J.R. (Jim) McFall,** *BSc(Ag)*, was honored recently with a distinguished agrologist award at the annual meeting of the Alberta Institute of Agrologists.

'28

N.D. McInnes, *BA*, is chaplain, head of the Department of Pastoral Care at Lions Gate Hospital, North Vancouver.

'34

MacKenzie L. Keith, *BSc*, of the College of Earth and Mineral Sciences, Penn State University, recently received his twenty-five-year chair and a plaque from the University.

'38

Ocean Cement Limited has announced the appointment of **George Ross,** *BSc(Eng)*, as president of the company, and in his new role Mr. Ross is located in Vancouver. Alberta's amalgamated district court system is headed by Chief Judge **John Decore**, *LLB*, formerly chief judge of the northern Alberta district court.

'42

Ronald E. Phillips, *BSc*, has been named vice-president in charge of planning and development at the University and is responsible for the development and planning of all physical construction programs.

'43

E.W. "Edge" King, *BSc(Eng)*, has been elected to an elite international business group, The Conference Board. The Board was founded in 1916 and its objective is a close study of domestic and international business management practices, economic trends, public affairs, and research.

'44

Canada Packers Limited has announced the appointment of **Richard Hill**, *BSc(Ag)*, as manager of the Ontario region.

H.B. Scott, BSc(Eng)'44

P. Ray Clarke, BSc(Eng)'48

C. Les Usher, BSc(Ag)'49

'47

The new president of Syncrude Canada Limited, **H.B. (Brent) Scott,** *BSc(Eng)*, has more than twenty-five years experience with Canadian oil industry construction projects.

'48

Robert G. Reynolds, *BSc(Eng)*, general manager of Alberta Sulphate Limited, has been appointed to the Board of Governors of the University. This past summer, **Rod Douglas,** *BSc(Eng)*, made his way to Yellowknife to take up his duties as group vice-president for Cominco. Mr. Douglas is responsible for the company's operations at the Con mine at Yellowknife as well as the Pine Point Mines Limited lead-zinc mine at Pine Point. **Robert Strother,** *BCom*, has been appointed senior vice-president with responsibility for government relations with Husky Oil. Texasgulf has announced the appointment of **P. Ray Clarke,** *BSc(Eng)*, as senior vice-president in charge of the company's metals division.

'49

C. Les Usher, *BSc(Ag)*, Deputy Minister of Culture, is president of the Institute of Public Administration of Canada. **Nancy (Johnson) Watson,** *BA*, is parent services worker at the Alberta Children's Hospital, Calgary.

'50

Roy L. Millar, *BSc(Ag)*, plant pathologist at the New York State College of Agriculture and Life Sciences, Cornell University, has been elected president of the Northeastern Division of the American Phytopathological Society. **Stanley P. Owen,** *BSc*, a resident of Kalamazoo, has received the Dr. William E. Upjohn Award from the Upjohn Company, a leading worldwide producer of pharmaceuticals and health care services. **Ronald Stuart MacLean,** *BEd*, has been appointed ambassador and head of the permanent Canadian delegation to the Organization for Economic Co-operation and Development (OECD).

'51

Don C. Brinton, *BSc(Ag)*, has been appointed executive vice-president and general manager of CanWest Broadcasting Limited, Winnipeg, which owns and operates station CKND-TV. **Edward B. Allan,** *BCom*, has been appointed to the University Board of Governors.

'53

Denison Mines Limited has announced the appointment of **Leo L. Samoil,** *BSc(Eng)*, as vice-president, oil and gas operations. **J.R. Mutch,** *BSc(Eng)*, is now joint interest and gas manager with Mobil Oil Canada Limited.

'54

Donald L. Simmermon, *BEd*, is director, management consulting branch, finance and facilities directorate, Environment Canada.

'55

Keith Penner, *BA*, federal member of parliament for Thunder Bay, is parliamentary secretary to the Honourable Charles Drury, Minister of State for Science and Technology. **Carol (Collier) Vine,** *BA*, is now director of the new Bob Miller Book Room, 180 Bloor Street West, Toronto. **Robert Gourdine,** *BEd*, is marketing manager of the mortgage investment division of Dial Mortgage Corporation Limited.

'56

John Bracco, *LLB*, a former Students' Union president, has been named a district court judge. As a lawyer, Judge Bracco specialized

mainly in domestic law and became actively involved in the Family Court Reconciliation project which provides counselling for families with problems. **Frank D. Jones,** *BA,* has been appointed Dean of the Faculty of Law, effective July 1. Mr. Jones, professor of law from 1969 to 1974 is currently a senior tax partner with the Toronto firm of Blaney, Pasternak, Smela, Eagleson, and Watson. **A.J. Birchill,** *BEd,* is superintendent of schools for the Wainwright School Division, having left the County of Stettler where he was employed as superintendent of schools from 1968 to 1975. **Oluf L. Gamborg,** *BSc(Ag),* is a senior research officer with the Prairie Regional Laboratory of the National Research Council, Saskatoon.

Roy L. Millar, BSc(Ag)'50

John Bracco, LLB'56

R. Younge, MD'65

'57

Major **Peter Nelson,** *BSc(PE),* is commandant of the Canadian Forces School of Physical Education and Recreation at Canadian Forces Base, Borden. **O. Humeniuk,** *BCom,* has been appointed treasurer of Hudson's Bay Oil and Gas Company Limited and is responsible for its tax and treasury functions. The deputy minister of construction, Alberta Transportation, has announced the appointment of **Kenneth E. Howery,** *BSc(Eng),* as director of operational planning.

'59

The former Dean of Education, **Myer Horowitz,** *MEd,* has been appointed vice-president (academic) of the University. The president-elect of the Alberta Medical Association is **Gerry Zetter,** *MD,* president of the Edmonton General Hospital medical staff and an AMA board member. **Margreta C.I. Spencer,** *RN,* a member of the first class in physiotherapy, is on the staff of the General Hospital, Safad, Israel.

'61

Jim Coutts, *LLB,* a Toronto business consultant who formerly served as Prime Minister Lester Pearson's appointments secretary, is principal secretary to the Prime Minister.

'62

George H. Peacock, *DDS,* is secretary-registrar-treasurer of the College of Dental Surgeons of Saskatchewan. **James T. Raleigh,** *MSc(PEng),* is president of Consolidated Natural Gas Company, Calgary. **C. James Richardson,** *BCom,* is a member of the sociology department, University of New Brunswick.

'63

"A dream come true!"—that's how **Egon Nikolai,** *DDS,* Burnaby dentist, described the launching of his fifty-one foot sailing vessel, the Sea-Fern. The Sea-Fern described by boating experts is "one of the finest sailing vessels in Vancouver."

'64

Frederick A. Laux, *LLB,* is acting Dean of Law, and **H.J.L. Irwin,** *LLB,* is associate Dean of Law at the University of Alberta.

'65

William MacGillivary, *MA,* is serving as assistant dean in the faculty of physical education and recreation, University of New Brunswick. **Brian R. Younge,** *MD,* a staff member of the Mayo Clinic, Rochester, is a consultant in ophthalmology. Appointed assistant secretary of General Motors of Canada Limited, **R.G. Bumstead,** *BA,* has charge of all real estate, tax, and legal matters.

'66

Now a research scientist with Agriculture Canada, Ottawa, **Jim Standish,** *MSc(Ag),* has duties in the field of dairy nutrition, animal research institute.

'67

Hugh E. Farquhar, *PhD,* former University of Victoria president, is acting president of Notre Dame University, Nelson, British Columbia.

'68

J.D. Shorthouse, *BSc,* is an assistant professor of biology at Laurentian University, Sudbury, Ontario. **David Holmes,** *BSc,* has joined the Foremost Foods Company research centre, Dublin, California, as group leader, industrial products. **Hal Chalmers,** *PhD,* has charge of the school of administration section, faculty of education, University of Moncton.

'69

Patricia Schick and **Marnie Swanson,** *BLS,* have joined counterparts in other parts of Canada and the United States in establishing a library consulting firm. Most of their work involves establishing technical libraries for business and government clients and developing lists of useful reference material which the client may order. **A. Dick Johnston,** *MBA,* is Minister of Municipal Affairs in the Alberta cabinet.

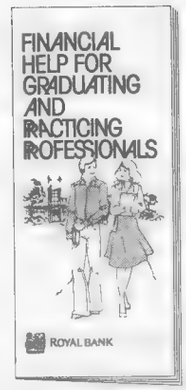
'70

R. Lynn Ogden, *BA,* is regional director, prairie region conservation centre, National Museums, Canada. His duties entail heritage conservation services to archives, museums, and galleries and conservation training and research. **Donald S. Wood,** *BCom,* is in partnership with a chartered accountancy firm in Whitecourt, Alberta. **David Beckman,** *BSc(Ag),* is working for the federal government in Lasooto, South Africa, on native range improvements, improving grasses and pastures. The Canadian Society of Respiratory Technologists has named **Michael B. Andrews,** *BEd,* as their president-elect.

'71

John A. Anonby, *PhD,* is acting head of the department of English, Trinity Western College, Langley, British Columbia. Recently selected to be listed in Who's Who in the South and Southwest is **David G. McCarley,** *PhD,* counselling psychologist in Dallas, Texas. **Theodore Weiden,** *MSc,* has joined the faculty, department of psychology, University of Prince Edward Island. **Brent D. Shaw,** *MA,* has been appointed Lecturer in Roman History at the University of Birmingham, England. Currently completing his PhD at the University of Cambridge, Mr. Shaw is thought to be the first Canadian classicist to hold a lectureship at a British University.

It's no good having a shingle if you don't have a roof.



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'72

Ken Richardson, *MA(History),* is the new registrar, East Kootenay Community College. **Moses A. Olade,** *MSc,* is a lecturer at University of Ibadan, Nigeria.

'73

Former head of Canada's foreign aid agency, **Maurice Strong,** *LLD,* is chairman and president of Petro-Canada, the new national oil company.

'74

As **John Cumberbatch,** *PhD,* explains it, "I am now at Sweden's northernmost university, as far north as Frobisher Bay, NWT. However the gulf stream helps to warm things up during the long winter nights." **John Simons,** *MSc,* is continuing to teach civil engineering subjects at James Cook University, North Queensland. **John Mason,** *BCom,* is executive director of the Alberta Council on Aging, the volunteer citizens' group concerned with all aspects of aging.

'75

Lillas M. Brown, *BSc(Ag),* is now supervisor of the agricultural societies program with the provincial government. Nearly 200 agriculture societies are active in Alberta. The recreation co-ordinator at Cherry Creek, British Columbia, is **Rick Olson,** *BSc(PE).* **Shabir Z. Masih,** *PhD,* is at the Massachusetts College of Pharmacy as an assistant professor, industrial pharmacy.

Although not unionized, the representatives of Alumni Associations of the Universities of Alberta, Calgary, and Lethbridge meet annually in concert to evaluate and examine matters of common concern. This year's Conference, hosted by the University of Alberta, was held in Lister Hall. Delegates went on record as favouring a policy enabling the Associations to raise matching funds more effectively. There was concern too that the Associations should have increased representation on their respective Boards of Governors.

As one of its concluding acts, the Conference established a committee to prepare a statement of Council objectives to be submitted at its next meeting in Lethbridge in 1977. Graduate representatives from the three institutions included: Back row (left to right) A.G. Markle, U. of A. Alumni Director; John Zaozirny (Calgary); Dave Usher (Edmonton); Jim Mackie, President U. of C. Alumni Association; Richard Johnson (Calgary); Jack Brosz (Lethbridge); Wilson Sterling, President, U. of A. Alumni Association; Bud Arbeau (Edmonton); Dale Alexander, U. of C. Alumni Director; Dr. Bernie Adler, Vice-President U. of A. Alumni Association; Bob Edgar (Edmonton). Front row (left to right) Elizabeth Schwob (Edmonton); Jean Owen (Calgary); Irena Kohut (Calgary); Diane Kepford (Calgary); Vi Shore (Lethbridge); Kathy Khan, President, U. of L. Alumni Association; Maureen McLeod (Calgary).

In Memoriam

Harry Ernest Bulyea, founder of the Faculty of Dentistry, at the age of 103, in Edmonton.
George Roy Stevens, *BA'15,* former historian and military writer, in Montreal.
Henry Alexander Dyde, *BA'16,* Rhodes Scholar and University benefactor, in Mexico.
Thomas Henry Lonsdale, *BA'18,* pioneer minister of Rundle United Memorial Church, in Banff.
George J. Bryan, *LLB'25,* chairman of Alberta Crimes Compensation Board, in Edmonton.
Gordon Saunders, *MD'26,* in North Vancouver.
Russell D. Henderson, *LLB'27,* former chairman, provincial board of public utility commissioners.
Elsie Mitchell Newland, *BA'29,* Vegreville teacher and local tutor, in Edmonton.
Raymond E. Shaul, *BA'34,* former director of school operations for Edmonton Public School Board, in Hawaii.
Harold A. McFarland, *BA'35,* former principal of Victoria Composite High School, in Edmonton.
Jack Wolverson Summers, *DDS'40,* dental practitioner, in Edmonton.
Elizabeth (Landels) Casselman, *BEd'45,* at Sian, Shensi Province, People's Republic of China.
David Allen Ferguson, *BSc(Eng)'45,* land surveyor, in Saskatoon.
James R. Leeder, *MD'48,* in Edmonton.
Norman Stanley Church, *BSc'50,* entomologist at the Agriculture Canada Research Station, in Saskatoon.
William G. Watt, *BSc(Eng)'51,* in an automobile accident.
Donald S. Ross, *LLB'51,* provincial court judge, in Edmonton.
Ralph L. Hay, *MD'53,* former chief of staff at the Rocky Mountain House General Hospital and coroner for the Rocky Mountain House area.
Nicholas Kraychy, *BEd'56,* in Edmonton.
Deane N. Calvert, *BSc(Pharm)'56,* professor at the Medical College of Wisconsin, Milwaukee, Wisconsin.
Annette (Bacon) Mireau, *Nu'57,* at the University Hospital, following kidney surgery.
David Lawrence Anderson, *BSc'65,* assistant professor, Department of Geography, University of Victoria.
Ronald Robin Smith, *BSc(Eng)'68,* in an accident near Houston, Texas.
Roland LeFrancois, *BA'69,* foreign service officer, Beirut, Lebanon.

Red Deer

Saskatoon

Grande Prairie

Regina

Red Deer. The Red Deer Branch has as its annual winter trademark the "Bookworm Banquet and Ball." It's good fare and fun and a highlight of the winter social scene. Great attention is paid to decorating the Red Deer College, readying ceramic give-aways and explaining to disconcolate alumni why the sold out sign has been out for several weeks. There are side benefits too, of a substantial nature. After expenses, proceeds matched by the General Alumni Association are directed to the College to assist its Learning Resource Centre and the purchase of a permanent art collection. Then there are rings presented annually to the best male and female students on behalf of the local Association. It's the kind of group graduate effort that in the words of W.G. Forbes, College President, "furthers the already excellent working relationship between the Alumni Association, the College and the University of Alberta".

Admiring a new addition to the permanent art collection is Mrs. Judy O'Brien, President of the Red Deer Alumni unit. A cheque from the Bookworm Ball proceeds is being presented to President Forbes by Mrs. Hazel Flewwelling, BEd'68, social convenor.

Regina. The first stop in a mid-Canada alumni branch tour in February was Regina. A good cross section of graduates were in attendance at the Regina Inn to welcome President Harry Gunning, seen in conversation with Rev. Harold Morris, BA'53.

Saskatoon. A very commendable number of graduates were on hand at the Sheraton-Cavalier to meet, not only President Gunning, but Dr. Bernie Adler, Vice-President of the General Alumni Association, seen left, alongside Mrs. Marrianne Haderlein, and Dr. Konrad Haderlein, GS'61.

Grande Prairie. Some 110 graduates and guests were entertained at dinner early in April at the Grande Prairie Regional College. Presentation of a handsome oil painting was made to the College on behalf of the Grande Prairie alumni unit. Admiring the "View of the Peace" are Chancellor Ron Dalby, left, and R. Guest, artist.

Winnipeg (1)

Winnipeg (2)

Los Angeles (1)

Los Angeles (2)

Winnipeg 1. After an evening of standing about visiting at the Winnipeg Inn, two distinguished gentlemen graduates, Dr. Jack Neilson, DDS'41, left, and Bill Bury, BA'37, sought a quiet corner of relaxation.

2. In genial good form at the Winnipeg Inn was past president and stalwart of the Windy City alumni unit. Art Larson, BSc(Ag)'49, was appreciative of the feminine company in the persons of wife, Ethel, right, and Mrs. Lois Brinton, BSc(HE)'53.

Los Angeles 1. Every spring, through the good offices of the Canadian Consulate in Los Angeles an "All Canadian Universities Graduates Reunion" is staged at the University of Southern California. The U. of A. party in attendance included President Harry Gunning, and Mrs. Donna Gunning, BA'61; Mr. Wilson Sterling, President of the General Alumni Association, Mrs. Sterling; and the alumni executive secretary. Special speaker was Dr. Lawrence J. Peter, whose latest book *Peter's Plan* has just been released. Seen in company with Dr. Peter are Mrs. Donna Gunning, President Gunning, and Mrs. Peter.

2. Of the 250 graduates and spouses present at the U.S.C. "Town and Gown" party, many are professionally employed in the Los Angeles area. Seen enjoying a moment of light camaraderie with Wilson Sterling, President of the Alumni Association (centre) are left to right, Dennis Nelson, BSc(Eng)'66, Ventura, Mrs. Louise Voloshin, and Dr. Peter Voloshin, MD'41, Pasadena.

Oakland/San Francisco (1)

Vancouver (1)

Vancouver (2)

Oakland/San Francisco (2)

Oakland/San Francisco 1. California was basking at 74°F under a cloudless sky when Dr. Bill Jackson, MD'53, and Mrs. Beth Jackson opened their lovely Oakland home for an afternoon reception. Distinguished among the broad section of U. of A. guests who turned out that afternoon to welcome the University president was George A. Maxwell, centre, in company with Dr. and Mrs. Gunning.

2. A delightful postscript to the afternoon reception was dinner at Trader Vic's. Enjoying the excellent fare is Mrs. Donna Gunning, in company with the evening's host, Dr. Jackson.

Vancouver 1. It was "wall to wall" graduates at an alumni reception at the home of Frank, BCom'48, and Helen McEvoy in Vancouver late in March. Special University guests included Dr. Myer Horowitz, BEd'59, Vice-President (Academic) (right) seen chatting with Dr. Ron Boyd, MD'69, treasurer of the Vancouver unit.

2. The ohs and ahs that greeted the serving of a delicious Chinese buffet dinner are reflected in the faces of the Vancouver branch hosts, the McEvoys.

3. Sharing a cordial moment of pre-dinner conviviality in Vancouver are Dr. Spencer Gallagher, DDS'54, Mrs. Rose Markle, Dr. Jim Sherbaniuk, BCom'56.

Vancouver (3)

Victoria (1)

Victoria (2)

Victoria (3)

Victoria 1. The Victoria Branch annual meeting at Royal Roads attracted over 200 persons including Bob Wishart, former director of scholarships and awards, and Mrs. Eugenie Myles, BA'27.
2. With executive changes, the new hand at the Victoria branch helm is George Gunn, BSc(Eng)'49, right, chatting with Wilson Sterling, President of the General Alumni Association, and Mrs. Betty Sterling.
3. On a bright sunny afternoon next to the sea, a light moment at Royal Roads was enjoyed by Mrs. Barbara Horowitz, Judge Blake Allan, and Bert Wilkins, BSc(Eng)'43, a past president of the Victoria unit.

How much energy do we need to enjoy life?

WE DRIVE big cars, use throw-away products, flick on heating and air conditioning switches with thoughtless abandon. We're on an energy binge and shortages are inevitable if we don't cut back on our growing consumption.

That's one argument for conservation. There are others: soaring capital costs, environmental impact, social distortion...

THE SIMPLE TRUTH is that we cannot live in the future as we have in the past. If we continue to gobble up energy at recent rates of increase, we'll need twice as much of it in just 12 years. *We won't have it!*

In terms of oil and gas production, our best years appear to be behind us. Most of our readily accessible hydro-electric sites are now in use. Coal deposits are difficult and costly to develop. Other forms of energy – biomass, solar, wind and nuclear for example – will have a role to play, but can't be depended upon to solve all our problems.

Conservation is the only energy option open to us which can work quickly and at low cost.

The goal: a saving of 40% by the year 2000.

A 20% cut in projected consumption by 1985 is a saving equal to 75% of our current oil imports. A 40% reduction by 2000 equals the output of 10,000 conventional oil wells or 55 nuclear stations.

This will not mean drastic changes in lifestyle. It's possible with modest savings in daily living, industry and transportation.

Is all our consumption and convenience really worth the price?

Other countries seem to have found comfortable standards of living without extreme energy consumption. In Sweden, a highly-industrialized country with a climate and living standard like ours, they use *one-third* less energy per person than we do.

France, Germany, Finland, the United Kingdom, Denmark and Italy all use less than half our energy per person.

By saving energy we can not only avoid future shortages but also improve our quality of life.

Efforts to lower consumption – through smaller cars, more mass transit, better built homes, more efficient industry, less waste production, more personal effort – will all save energy. And help our environment. And help to fight inflation. And help to make us more self-reliant and appreciative of simple pleasures.

In short, energy conservation can improve our overall quality of life.

Yes, it will take some effort because we've grown accustomed to waste. But is there any sensible alternative? **If you're not part of the solution, you're part of the problem.**

Get involved with energy conservation.

Keep in touch with developments in the energy field. Find out how you can promote and encourage conservation in your community or through your profession. Add your name to the mailing list for the *Energy Conservation Newsletter.* Free when you send in this coupon.

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Énergie, Mines et Ressources Canada
Bureau de la conservation de l'énergie
L'Hon. Alastair Gillespie
Ministre

Alumni Homecoming 1976

Friday, October 15
8:00 p.m. to 10:00 p.m.
Wine and Cheese Party
Meet the Profs
(Faculty Club) $3 per person

Saturday, October 16
10:00 a.m.
Tours—Campus Buildings
(Rutherford Galleria—departure)

11:30 a.m.
Pre-game Luncheon $1.50 children
(Lister Hall) $2.50 adults

2:00 p.m.
Football Game
University of Alberta vs.
University of British Columbia
(Campus Grid) Free with above luncheon

6:30 p.m.
Pre-Homecoming Banquet and Ball Reception
Happy Hour (cash bar)
(Lister Hall)

7:30 p.m.
Homecoming Banquet and Ball
(Lister Hall) $8 per person

9:00 p.m.
Dancing to the "Capris"

Tickets—Alumni Office
602 Students' Union Building (432-3224)
Cheques payable—The University of Alberta

Special Classes
'16 '26 '36 **'51** '56 '66 '71

On-campus privileges for alumni

Privilege Cards. Full on-campus swimming privileges for alumni and their families are available at the University's Physical Education and Recreation Centre. Privilege cards for 1976-77 are now on sale at the Alumni Office, sixth floor, Students' Union Building. Yearly rates are: alumni family $30; single alumnus $20; spouse $10; children $10. Swimming hours now in effect are as follows:

West Pool

Monday to Friday, 11:30 a.m. to 1 p.m., 7 p.m. to 9 p.m.
Monday, Wednesday, Friday, 4 p.m. to 5:30 p.m.
Tuesday, Thursday, 4 p.m. to 5 p.m.
Saturday and Sunday, 1 p.m. to 4 p.m., 6 p.m. to 8 p.m.

Family swims (West Pool), children

Monday, Wednesday, Friday, 4:45 p.m. to 5:30 p.m.
Tuesday, Thursday, 7 p.m. to 8 p.m.
Saturday and Sunday, 2 p.m. to 4 p.m., 6 p.m. to 7:30 p.m.

Towels and lockers (for adults only) are available from the equipment rooms; $5 refundable deposit.

Indoor and outdoor jogging and weight lifting room (adults only) are free with privilege cards. Hours of operation of the Physical Education and Recreation Centre are 7 a.m. to 11 p.m. daily. Sundays and holidays, 12 p.m. to 5 p.m.

Alumni Library Privileges. Alumni have certain privileges at the University Libraries. They may enter and use library materials. Also, borrowing privileges are permitted to a member of the Alumni Association who has a demonstrable research need. Arrangements for borrowing privileges may be made by contacting the head librarian's office.

Humanities and Social Sciences Library, Rutherford North

Call From C.S.O.

The Christian Science Organization at the University of Alberta would like to contact all graduates of this University who are members of the Mother Church, First Church of Christ, Scientist, Boston, Massachusetts. Recent changes in the Organization's By-Laws make provisions for these graduates to become graduate members, regardless if they were previous members of the Organization when attending University. Please send all enquiries to John Park, President of Christian Science Organization at the University of Alberta, 10934-85 Avenue, Edmonton.

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